

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. – 41. (Cancelled)

42. (Previously Presented) A plasma processing apparatus comprising:
a vacuum processing chamber,
a pair of plate electrodes opposite to each other, one of the electrodes being used also as a sample table capable of holding a sample having a diameter of 300 mm or more containing an insulator film,
a gas introducing means capable of introducing a fluorine-containing etching gas into the vacuum processing chamber,
a plasma generating means for forming said introduced gas into a plasma, and
means for decreasing the amount of fluorine in the plasma to decrease the amount of fluorine near the sample, said decreasing means comprising an electrode cover comprising a material containing Si or C on the other of the pair of plate electrodes to react with fluorine and setting a gap between said pair of plate electrodes to 30 mm to 60 mm,
wherein a pressure in the atmosphere between the pair of plate electrodes is set to 0.5 Pa to 4.0 Pa, and

wherein a high frequency electric power of 30 MHz to 200 MHz is applied to between the pair of plate electrodes.

43. (Previously Presented) A plasma processing apparatus according to claim 42, wherein the gas introducing means has a gas diffusion plate, and the electrode cover situated downstream of the gas diffusion plate has fine plural apertures.

44. – 45. (Cancelled)

46. (Previously Presented) A plasma processing apparatus according to claim 42, wherein a discharge confining ring and/or a susceptor cover containing Si or C is situated near the sample.

47. (Previously Presented) A plasma processing apparatus according to claim 46, wherein the insulator between the susceptor cover and the sample table has a thickness of 0.5 mm to 5 mm.

48. – 49. (Cancelled)

50. (Previously Presented) A plasma processing apparatus according to claim 42 further comprising a bias electric power source connected to said one electrode used as a sample table for applying a bias voltage to said sample table.

51. (Currently Amended) A plasma etching apparatus comprising a vacuum processing chamber and a pair of electrodes opposite to each other that are disposed in said vacuum processing chamber, one of said electrodes being used also as a sample table capable of holding a sample having a diameter of 300 mm or more containing an insulator film,

wherein said plasma etching apparatus further comprises:

a gas introducing means for introducing an etching gas containing at least fluorine and carbon into said vacuum processing chamber;

a high-frequency power source to apply a high-frequency electric power of 30 MHz to 300 MHz between said pair of electrodes whose gap is set to 30 mm to 100 mm so as to generate a plasma with a density of $5 \times 10^{10} \text{ cm}^{-3}$ to $5 \times 10^{11} \text{ cm}^{-3}$ between said pair of electrodes; and

a bias electric power source connected to one of said electrodes to control energy of ions in said plasma.

52. (Previously Presented) A plasma etching apparatus according to claim 51, further comprising means for setting an atmospheric pressure inside said vacuum processing chamber to 0.4 Pa to 4.0 Pa.

53. (Previously Presented) A plasma etching apparatus according to claim 51, where said one of said electrodes is provided with an electrostatic attracting film, heat transfer gas being supplied between said electrostatic attracting film and a back surface of said sample.

54. (Previously Presented) A plasma etching apparatus comprising a vacuum processing chamber and a pair of parallel plate electrodes opposite to each other that are disposed in said vacuum processing chamber, one of said electrodes being used also as a sample table capable of holding a sample,

wherein a plasma with a density of $5 \times 10^{10} \text{ cm}^{-3}$ to $5 \times 10^{11} \text{ cm}^{-3}$ is generated between said pair of electrodes, and a gap between said pair of electrodes is set to a distance capable of utilizing surface reaction between said pair of electrodes effectively.

55. (Previously Presented) A plasma etching apparatus according to claim 51, wherein said gap is set to a distance capable of utilizing surface reaction between said pair of electrodes effectively to decrease the amount of fluorine in said plasma near said sample.